



**Casedhole Solutions**

**DUAL INDUCTION LOG**

Company L.D. DRILLING, INC.  
Well #1 YORK 25C  
Field WILDCAT  
County GOVE  
State KANSAS

Company L.D. DRILLING, INC.  
Well #1 YORK 25C  
Field WILDCAT  
County GOVE State KANSAS

Location: 1815' FSL & 2310' FWL  
API #: 15-063-22281-0000  
Permanent Datum GROUND LEVEL Elevation 2722  
Log Measured From KELLY BUSHING 5' A.G.L.  
Drilling Measured From KELLY BUSHING  
Elevation  
CDL/CNL  
MEL  
K.B. 2727  
D.F. 2725  
G.L. 2722

|                              |                   |                    |  |
|------------------------------|-------------------|--------------------|--|
| Date                         | 1/17/16           |                    |  |
| Run Number                   | ONE               |                    |  |
| Depth Driller                | 4507              |                    |  |
| Depth Logger                 | 4509              |                    |  |
| Bottom Logged Interval       | 4507              |                    |  |
| Top Log Interval             | 00                |                    |  |
| Casing Driller               | 8 5/8" @ 347      |                    |  |
| Casing Logger                | 326               |                    |  |
| Bit Size                     | 7 7/8"            |                    |  |
| Type Fluid in Hole           | CHEMICAL MUD      | CHLORIDES 1100 PPM |  |
| Density / Viscosity          | 9.1/59            |                    |  |
| pH / Fluid Loss              | 10.5/6.8          |                    |  |
| Source of Sample             | FLOWLINE          |                    |  |
| Rm @ Meas. Temp              | 1.2 @ 40F         |                    |  |
| Rmt @ Meas. Temp             | .90 @ 40F         |                    |  |
| Rmc @ Meas. Temp             | 1.4 @ 40F         |                    |  |
| Source of Rmf / Rmc          | MEASUREMENT       |                    |  |
| Rm @ BHT                     | .40 @ 120F        |                    |  |
| Time Circulation Stopped     | 2 HOURS           |                    |  |
| Time Logger on Bottom        |                   |                    |  |
| Maximum Recorded Temperature | 120F              |                    |  |
| Equipment Number             | 4010              |                    |  |
| Location                     | HAYS, KANSAS      |                    |  |
| Recorded By                  | JASON CAPPELLUCCI |                    |  |
| Witnessed By                 | KIM SHOEMAKER     |                    |  |

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

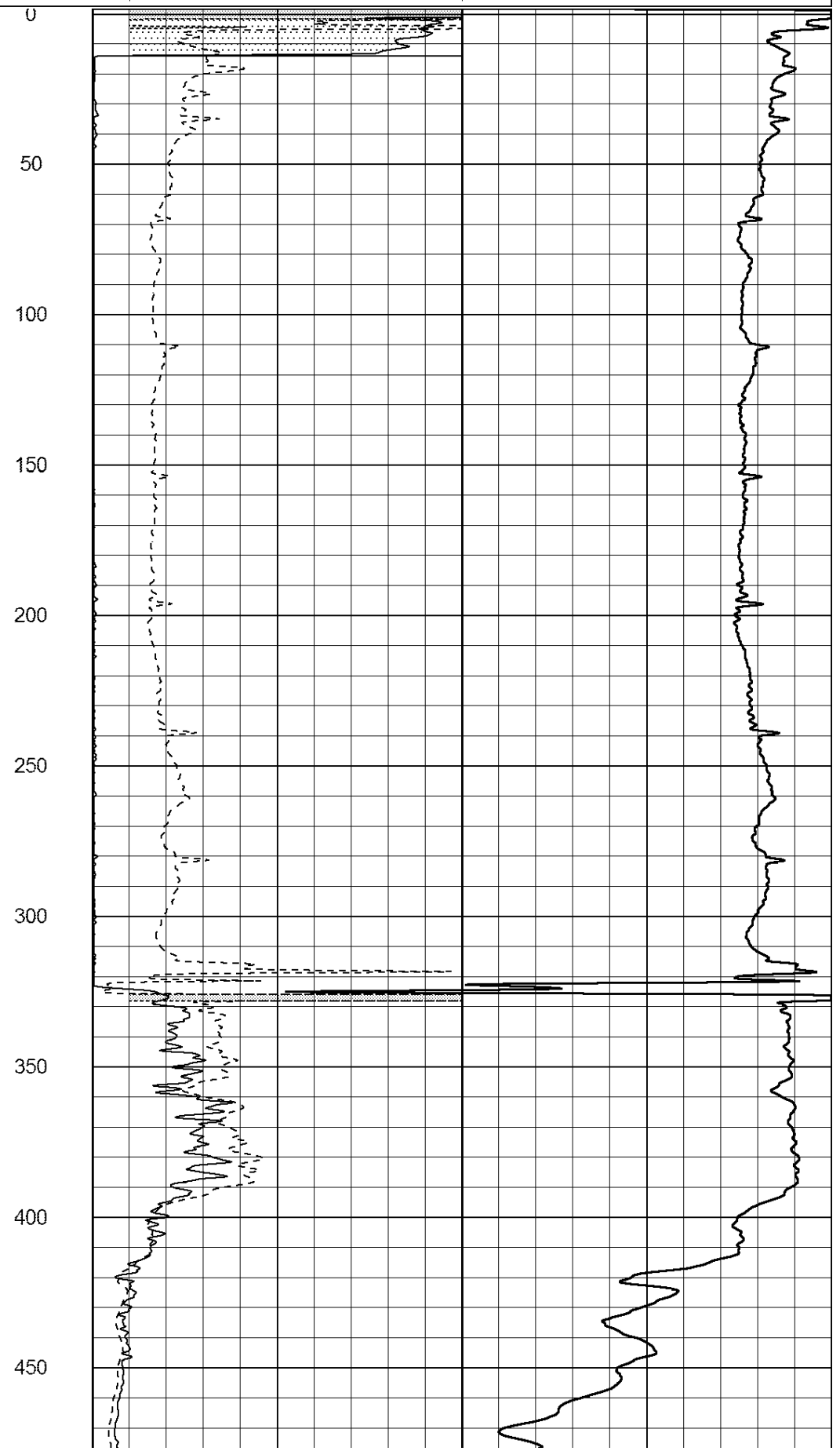
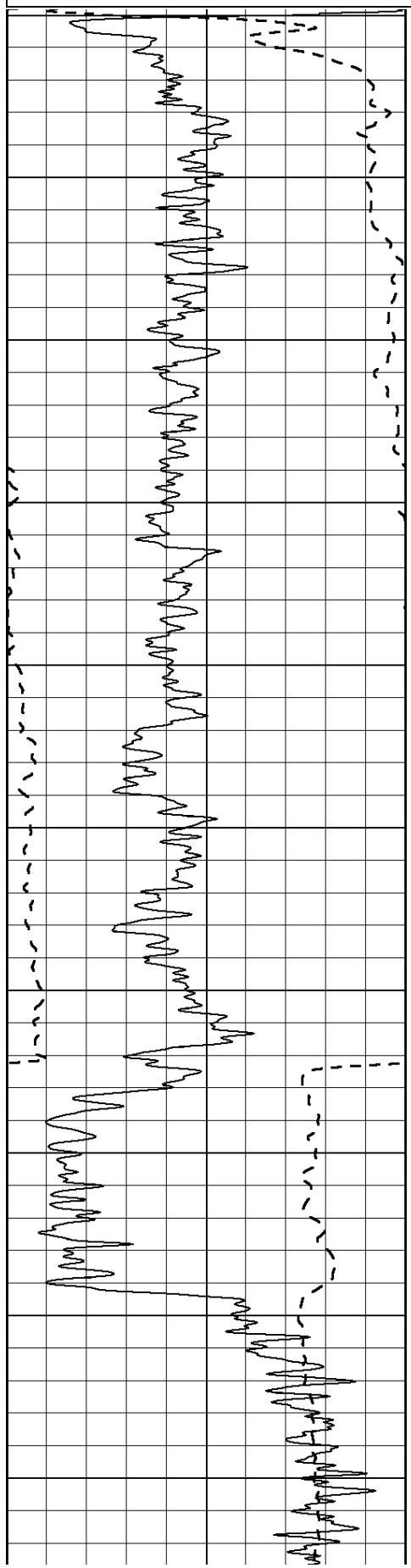
THANK YOU FOR USING CASEDHOLE SOLUTIONS, HAYS, KS. (785) 628-6395  
DIRECTIONS:  
HEALY, KS. - 1 WEST TO BISON RD. - 7 NORTH TO 290 RD.  
(ROAD JOGS WEST TWO TIMES) - 1 WEST ON 290 RD TO WILLOW RD.  
2 NORTH - WEST & NORTH INTO

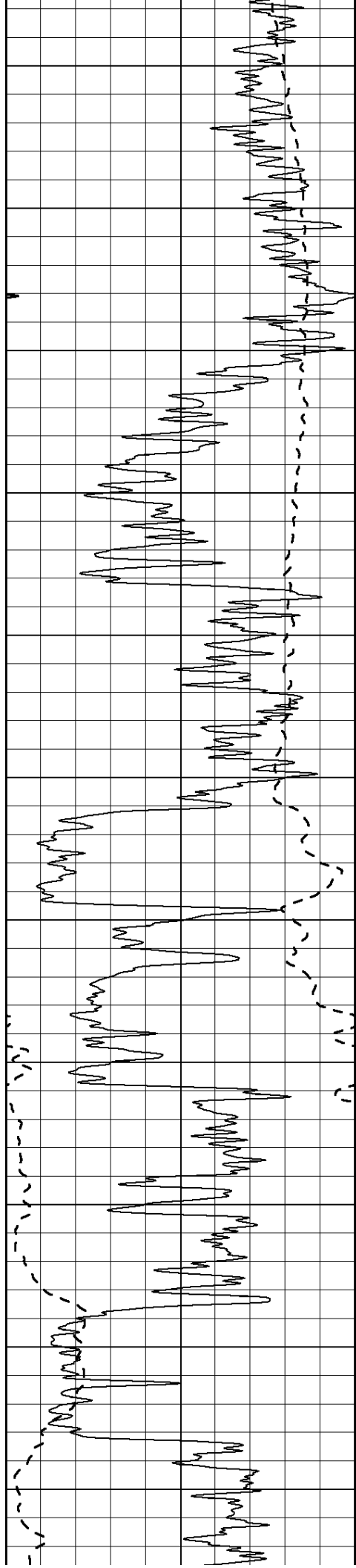
|      |                  |     |
|------|------------------|-----|
| 0    | Gamma Ray (GAPI) | 150 |
| -100 | SP (mV)          | 100 |

|   |              |    |
|---|--------------|----|
| 0 | RLL3 (Ohm-m) | 50 |
| 0 | RILD (Ohm-m) | 50 |

|      |               |   |
|------|---------------|---|
| 1000 | CILD (mmho/m) | 0 |
|------|---------------|---|

|    |                  |     |
|----|------------------|-----|
| 50 | RILD X10 (Ohm-m) | 500 |
| 50 | RLL3 X10 (Ohm-m) | 500 |





500

550

600

650

700

750

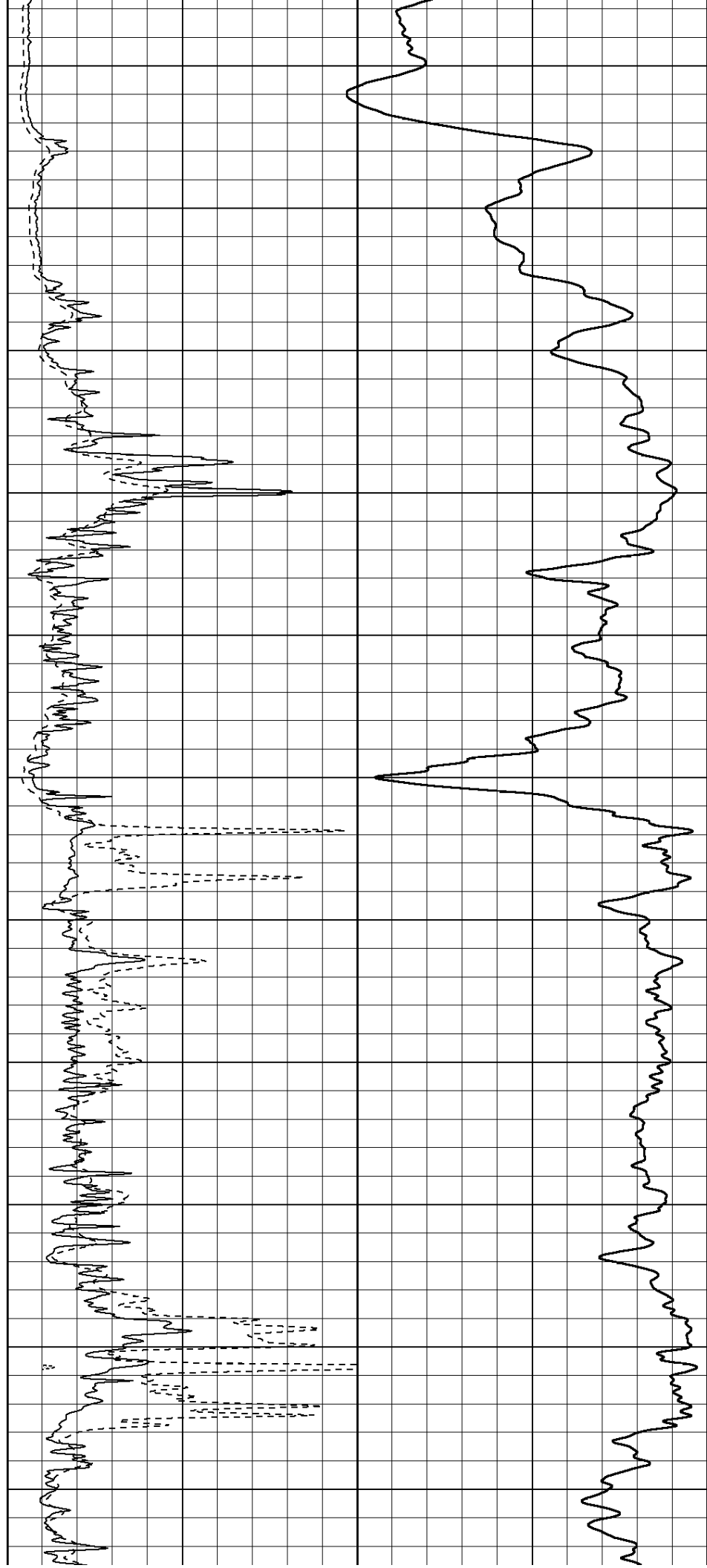
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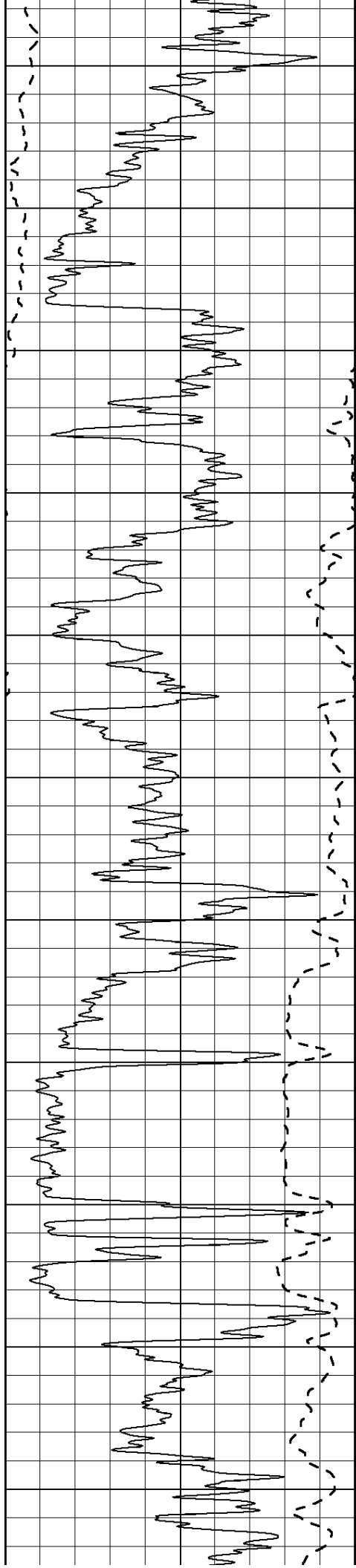
850

900

950

1000





1050

1100

1150

1200

1250

1300

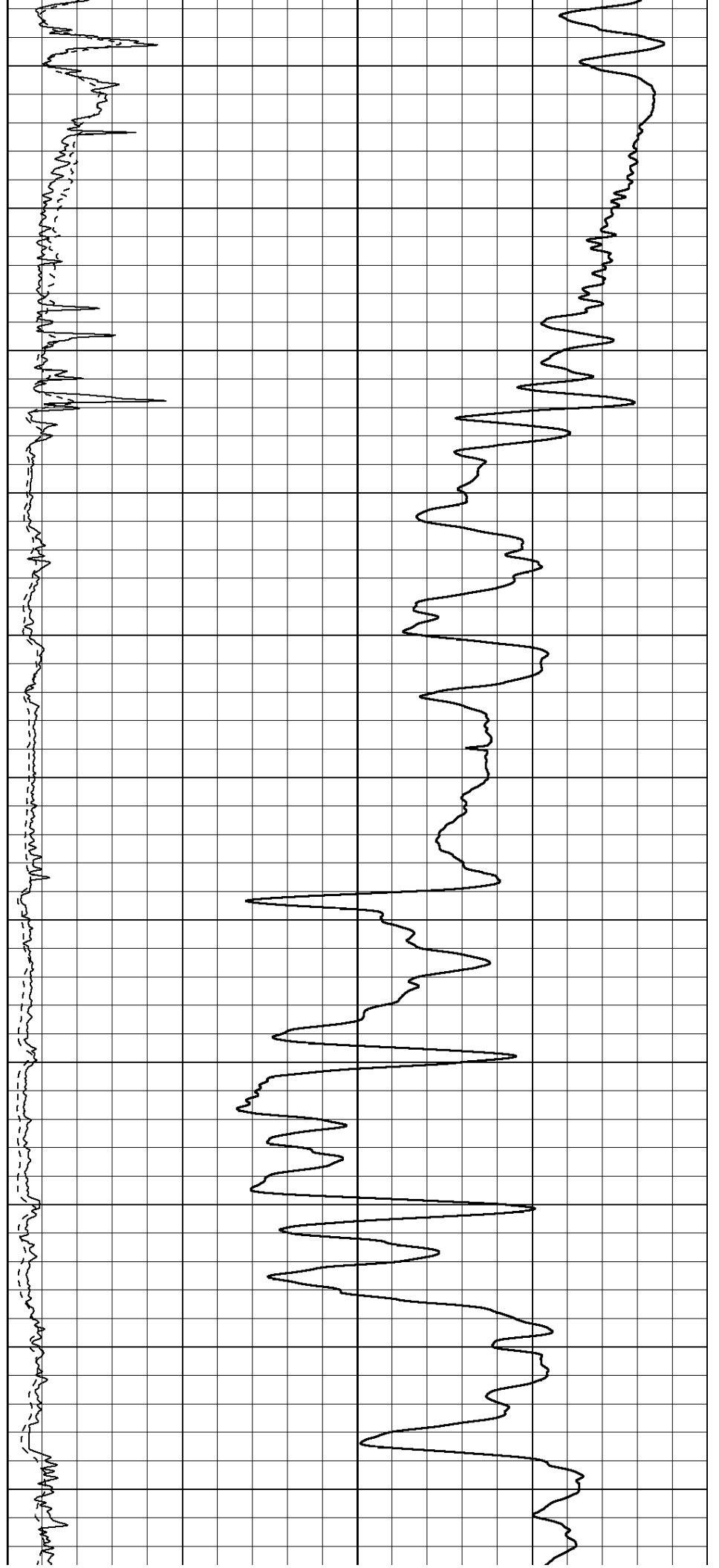
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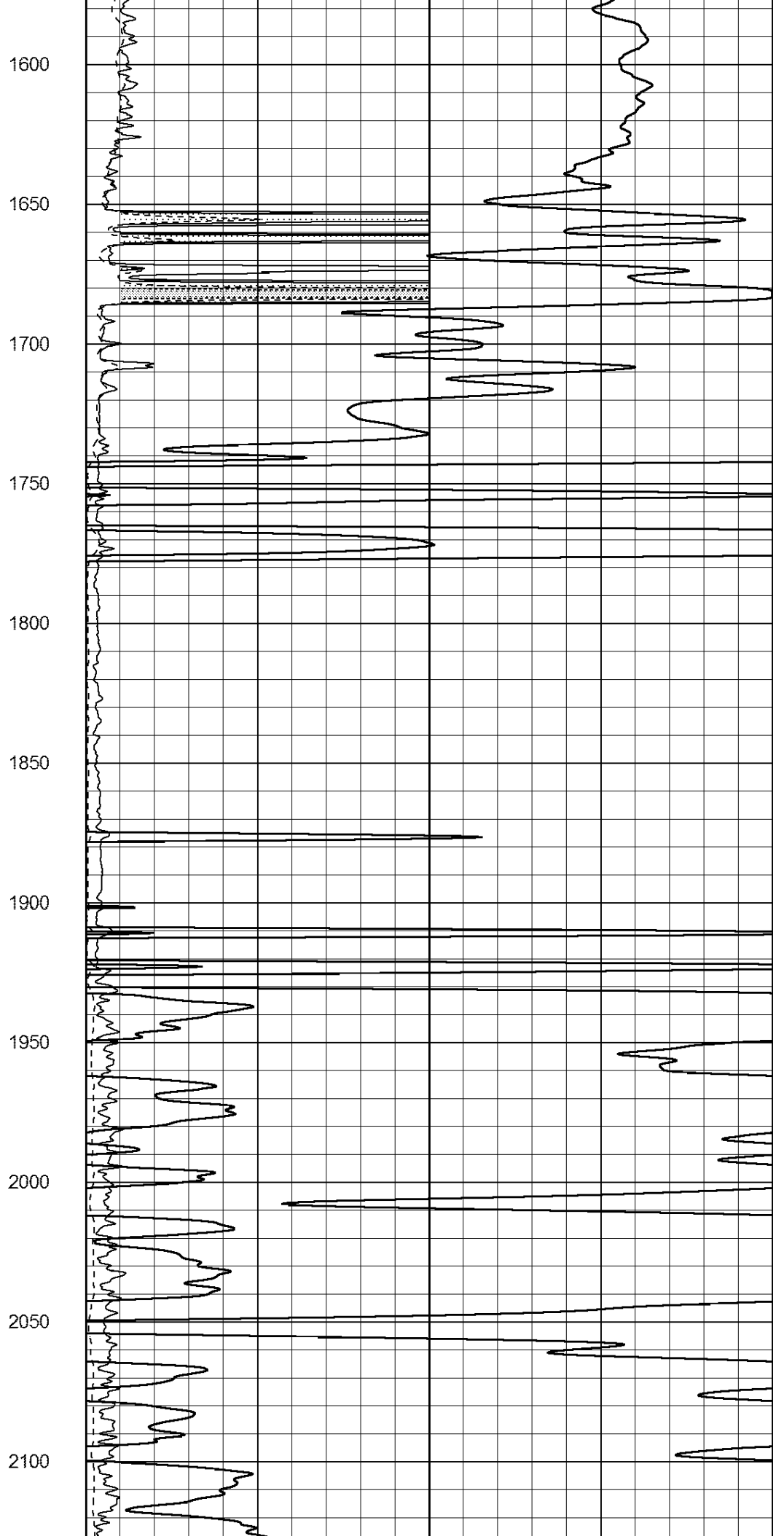
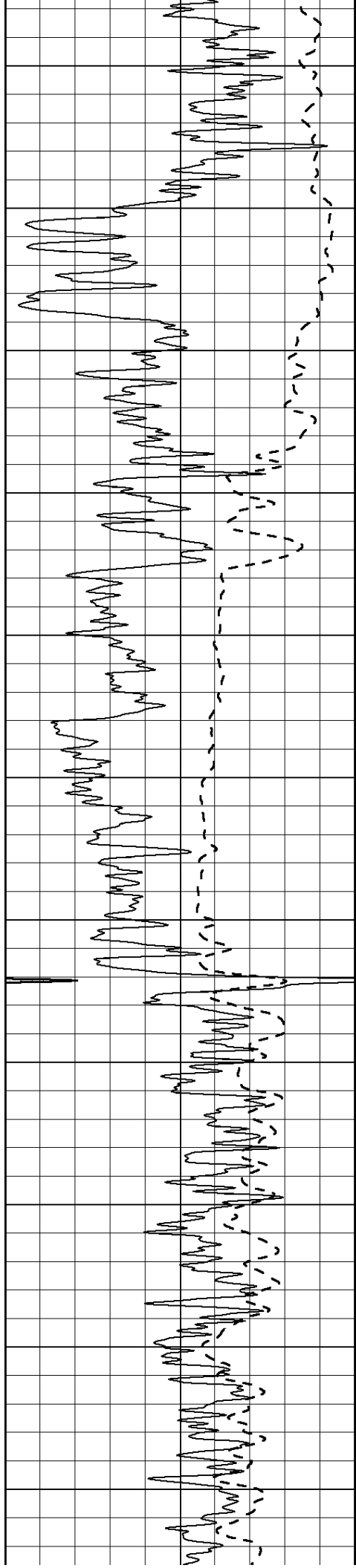
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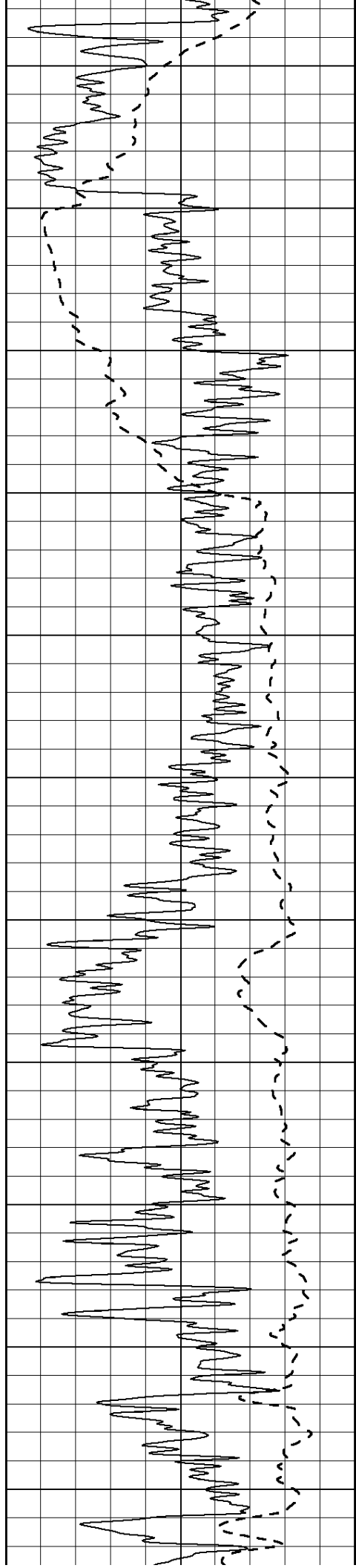
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1500

1550







2150

2200

2250

2300

2350

2400

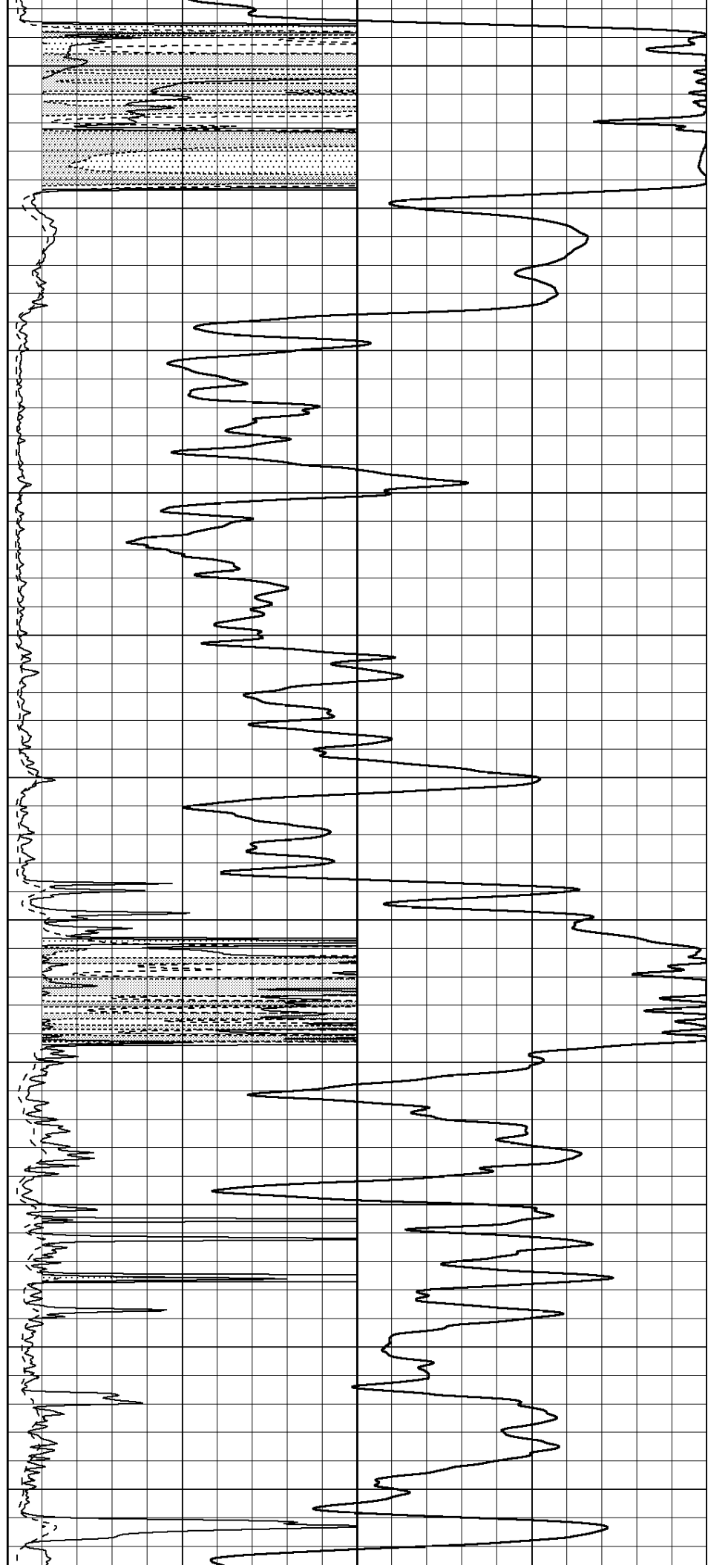
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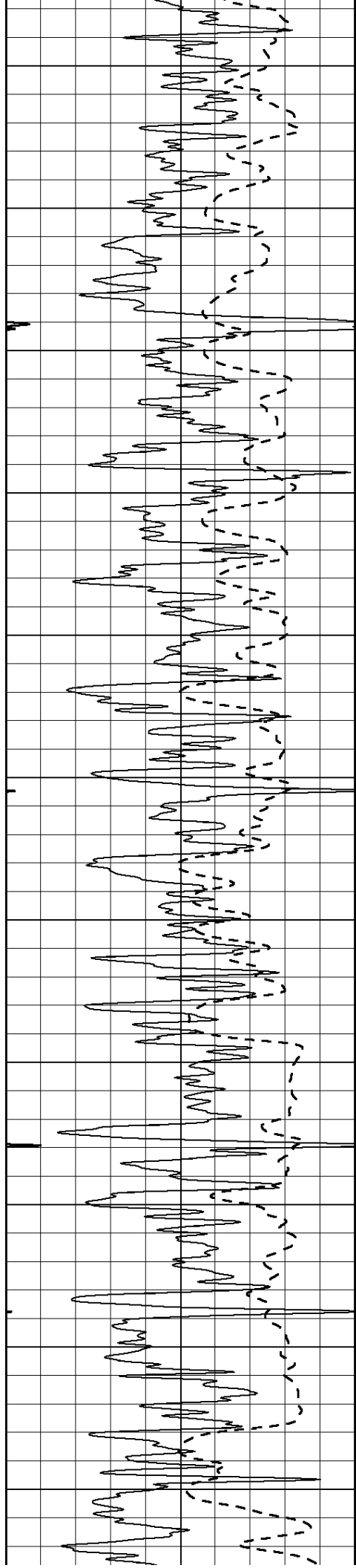
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2550

2600

2650





2700

2750

2800

2850

2900

2950

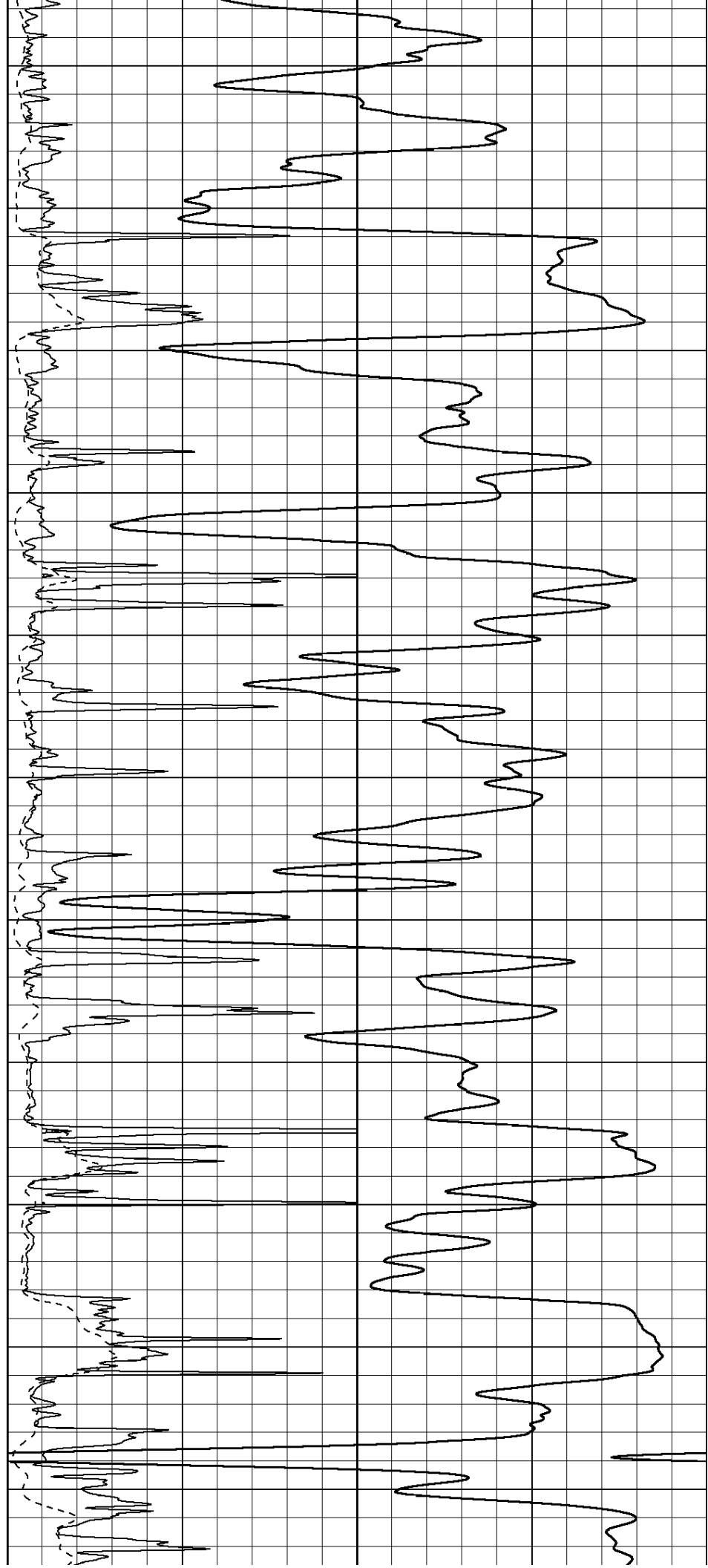
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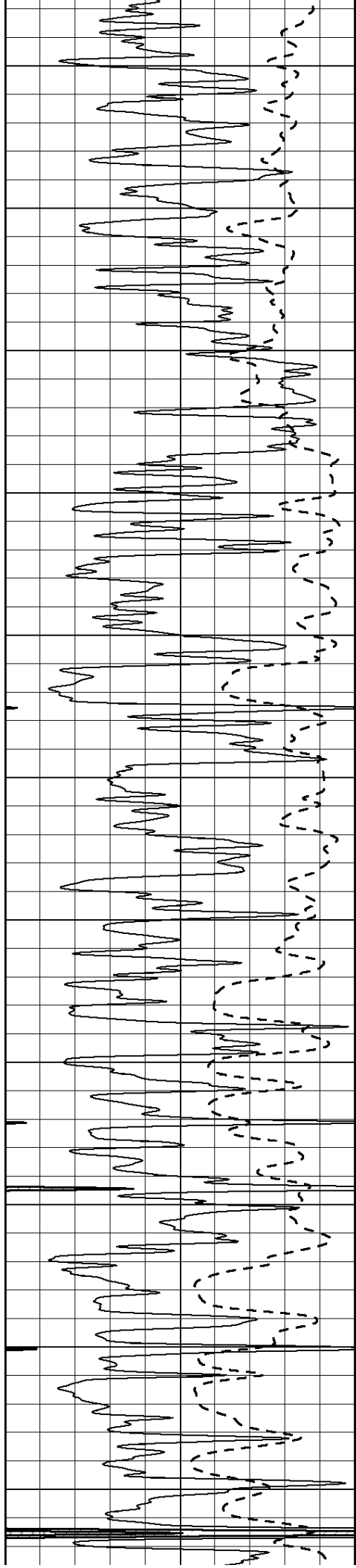
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3100

3150

3200





3250

3300

3350

3400

3450

3500

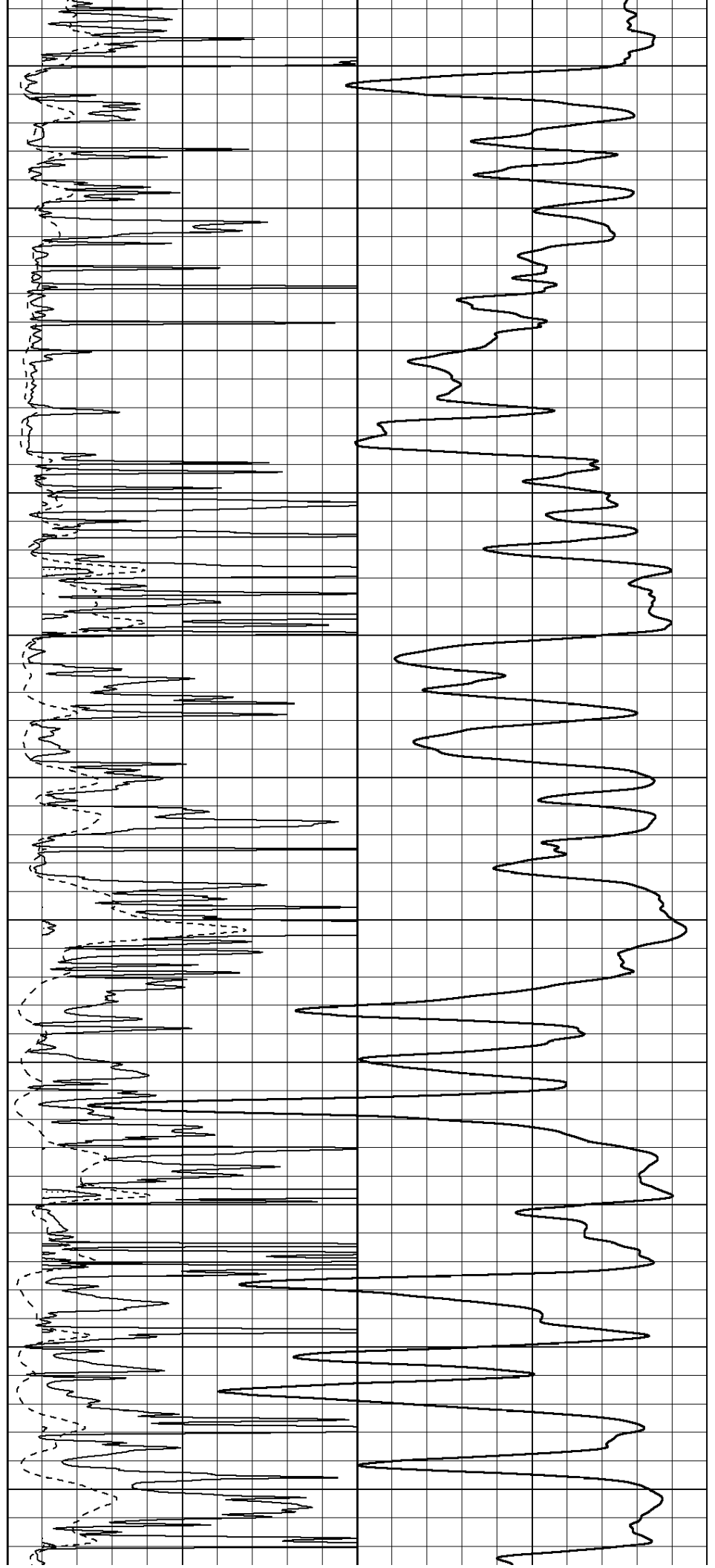
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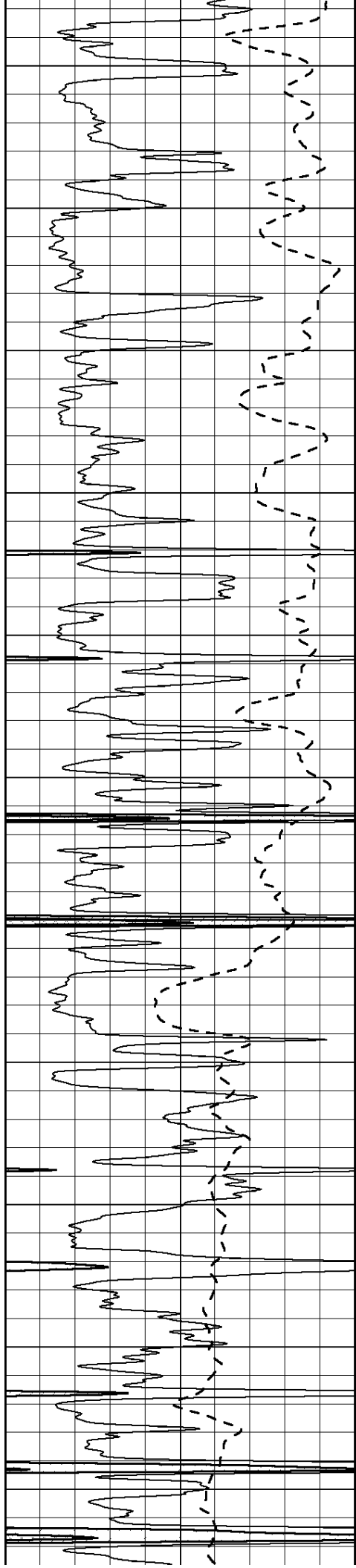
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3650

3700

3750





3800

3850

3900

3950

4000

4050

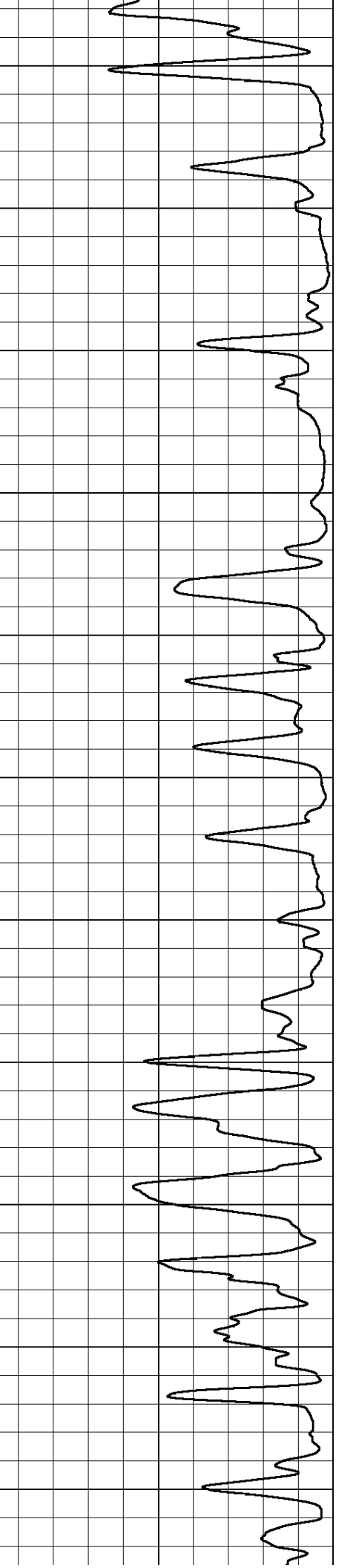
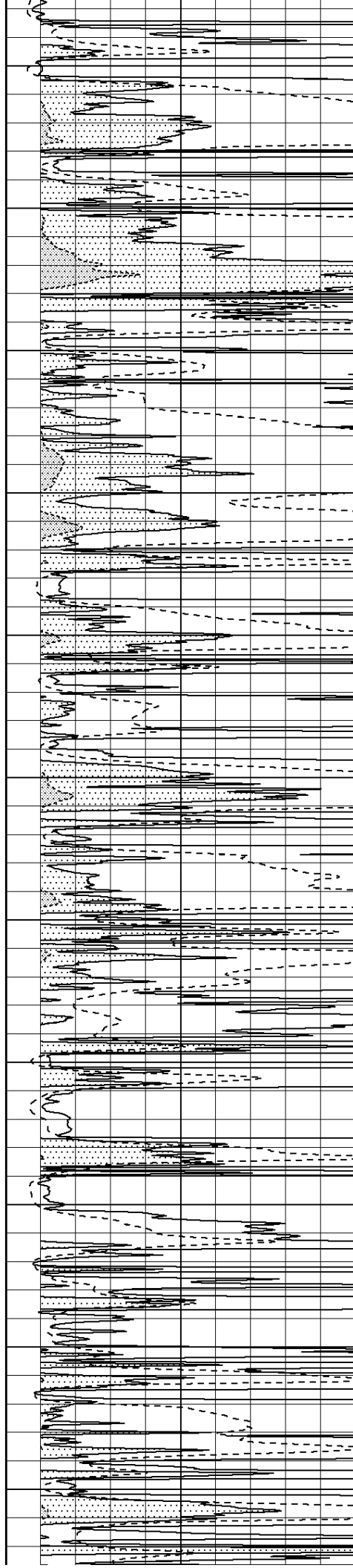
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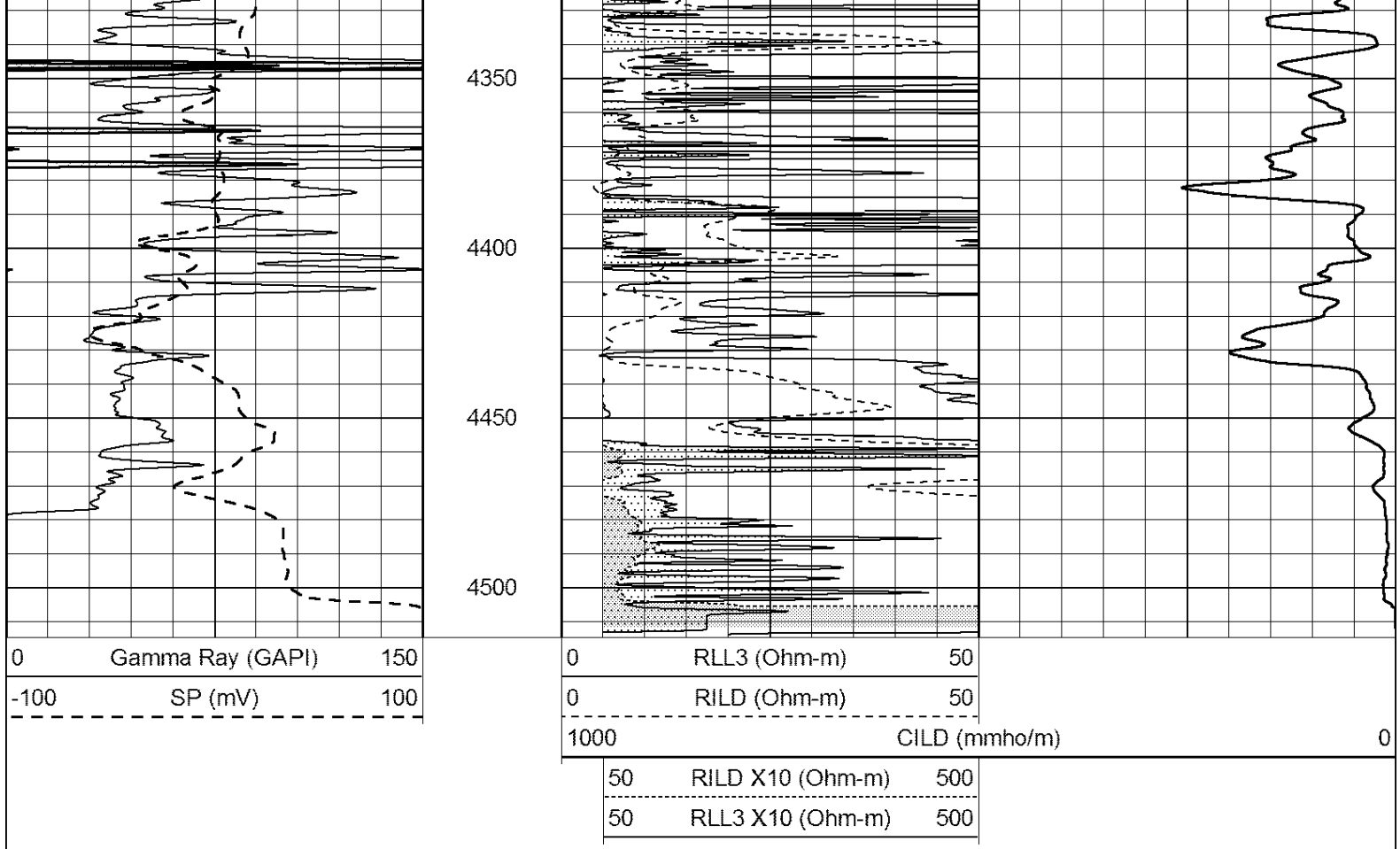
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4200

4250

4300



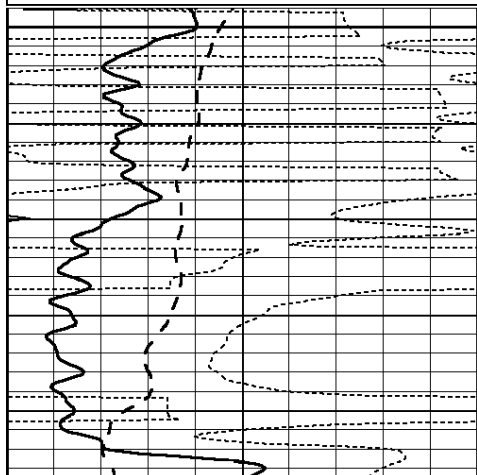


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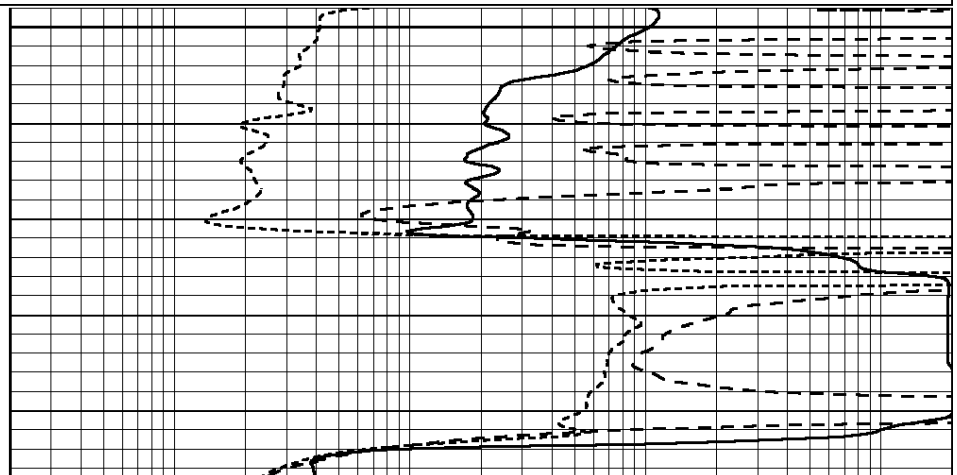
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 Presentation Format: \_dil  
 Dataset Creation: Sun Jan 17 18:51:28 2016 by Calc Open-Cased 090629  
 Charted by: Depth in Feet scaled 1:240

|      |                  |     |     |                          |      |
|------|------------------|-----|-----|--------------------------|------|
| 0    | GAMMA RAY (GAPI) | 150 | 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| -100 | SP (mV)          | 100 | 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |
| -250 | Rxo/Rt           | 50  | 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |
| 0    | MINMK            | 20  |     |                          |      |



2150

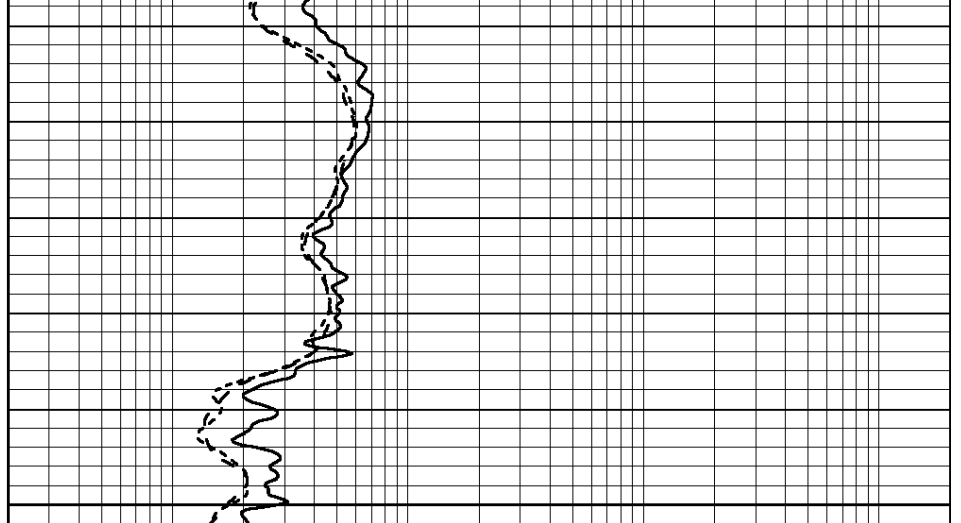




2200

2250

|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 20  |



|     |                          |      |
|-----|--------------------------|------|
| 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |
| 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |



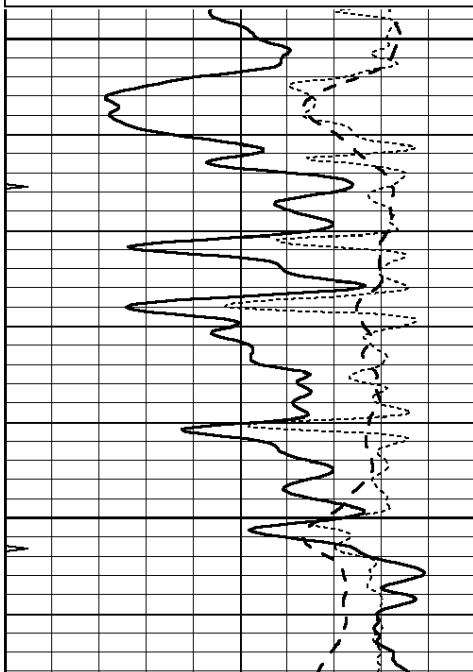
**Casedhole Solutions**

# MAIN SECTION

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 Presentation Format: \_dil  
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 Charted by: Depth in Feet scaled 1:240

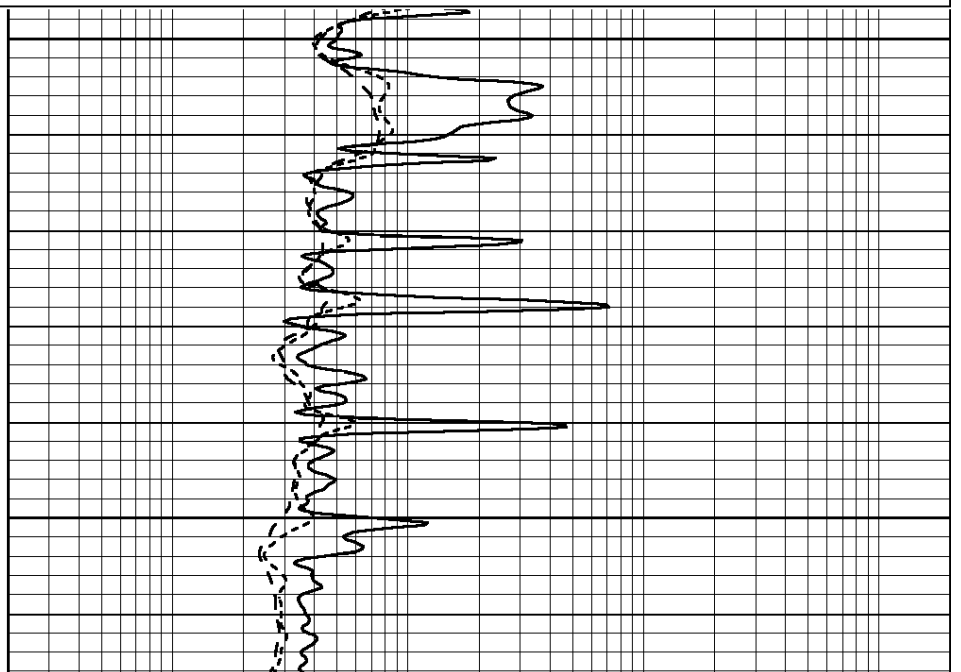
|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 20  |

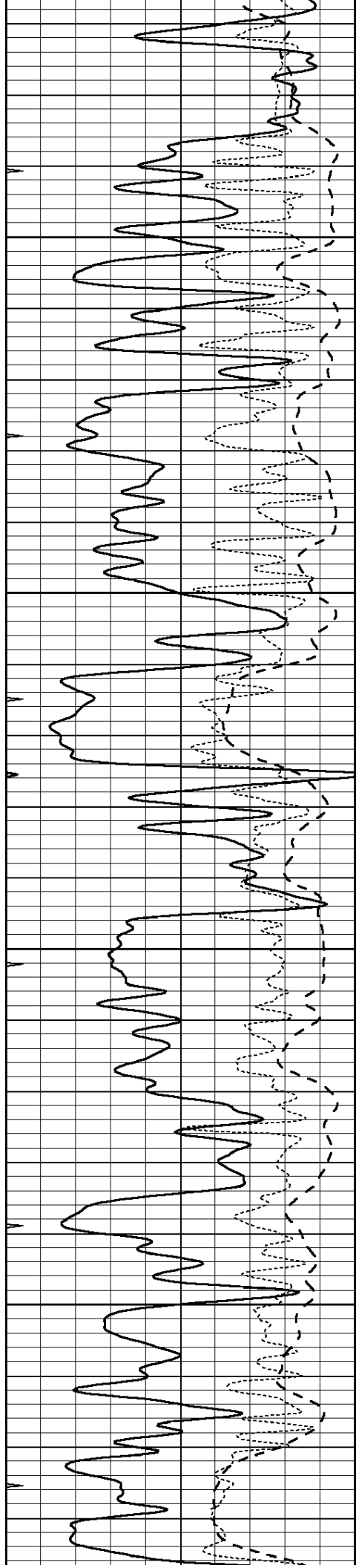
|     |                          |      |
|-----|--------------------------|------|
| 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |
| 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |



3300

3350



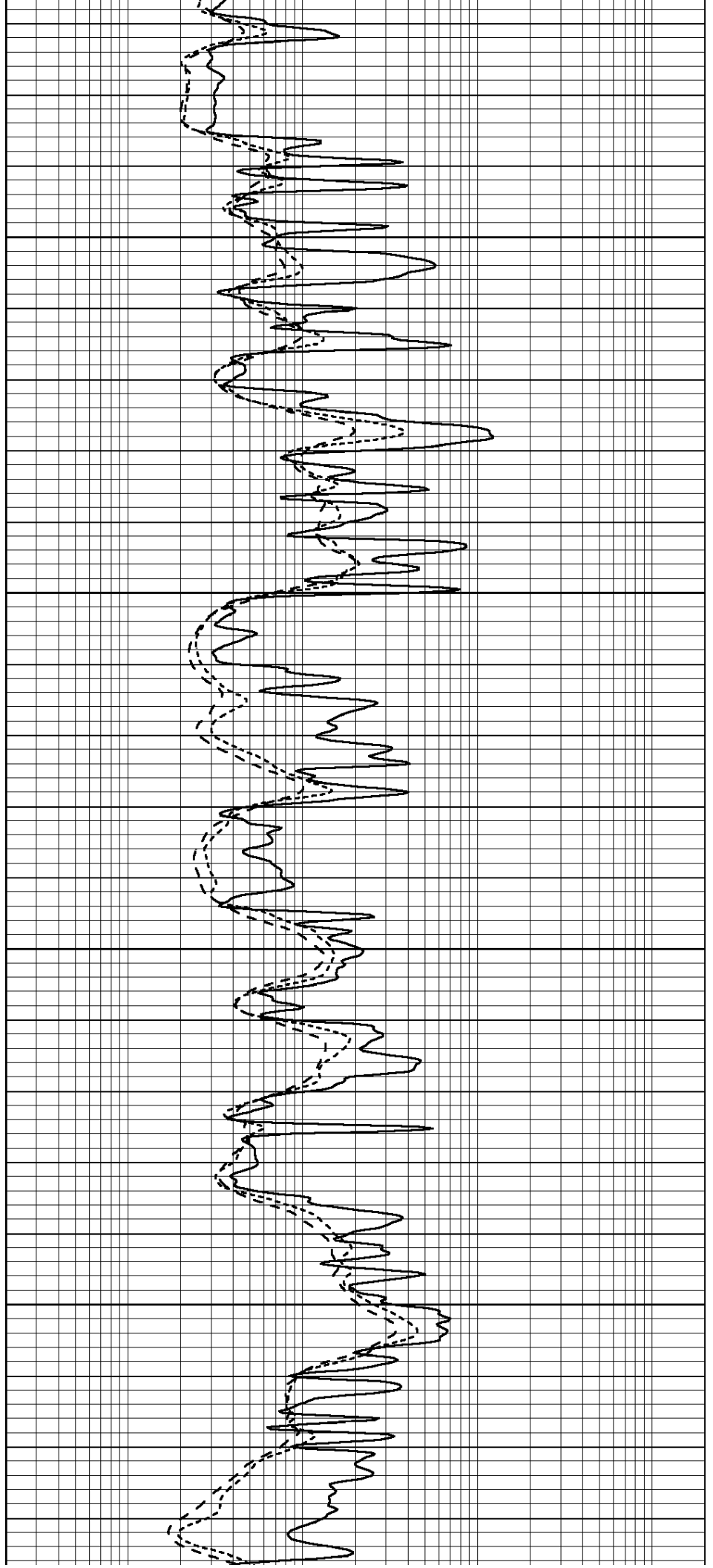


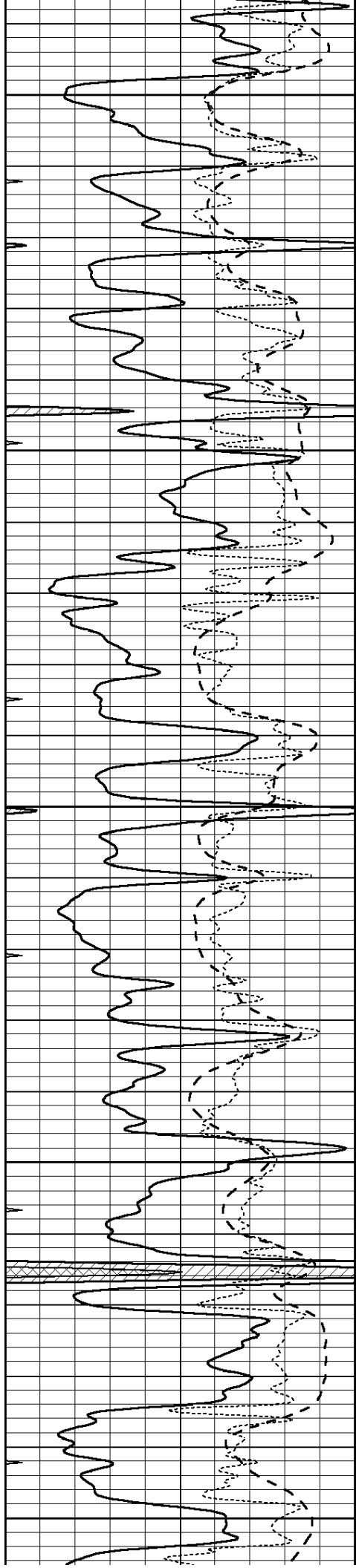
3400

3450

3500

3550





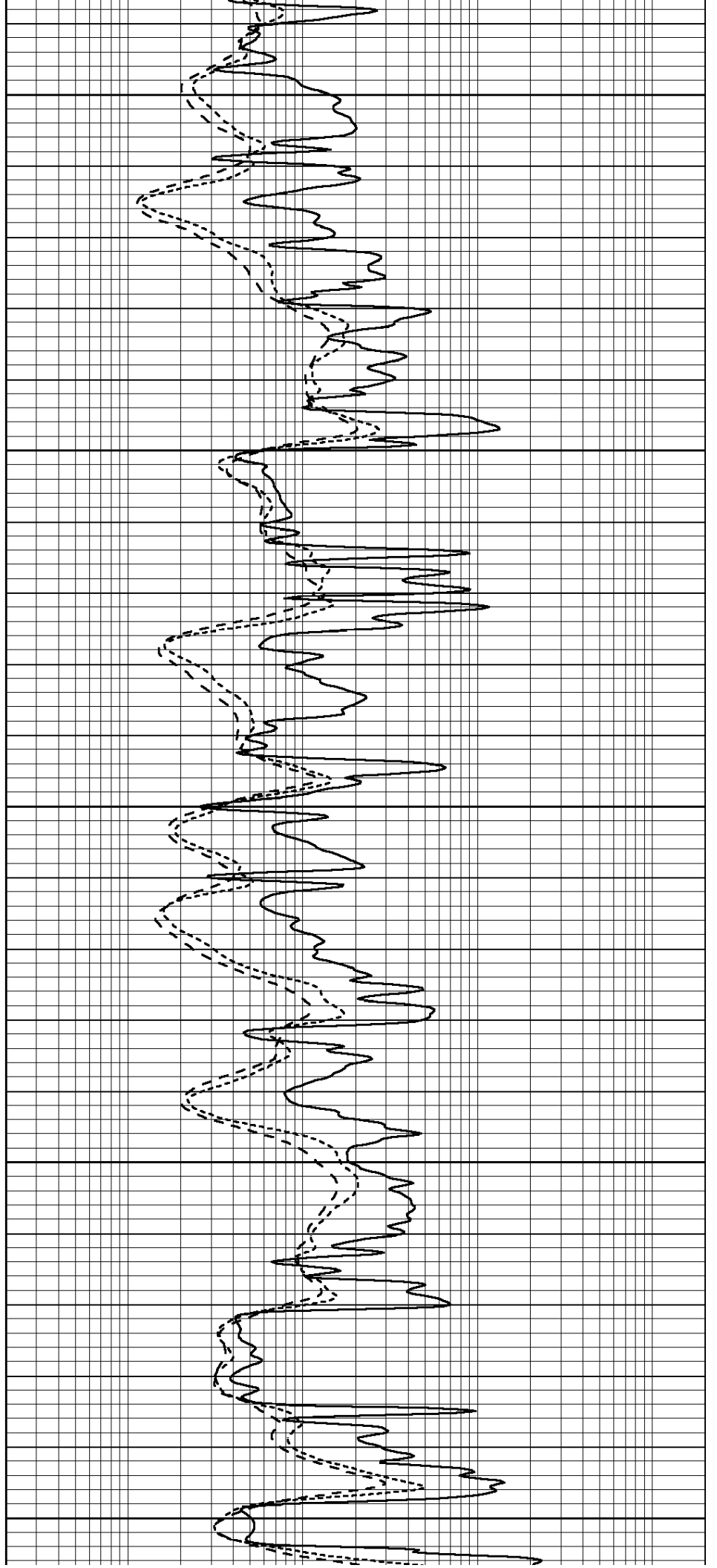
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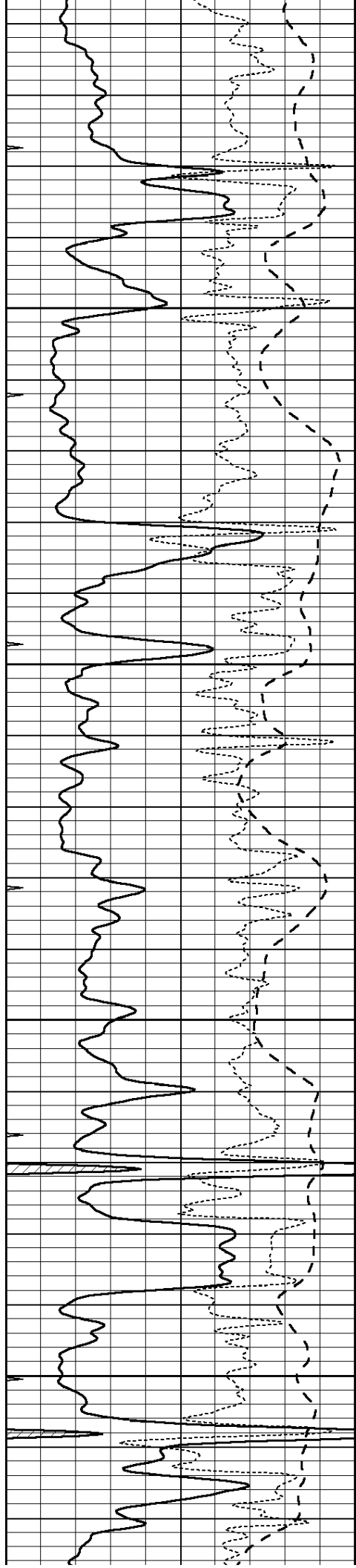
3650

3700

3750

3800



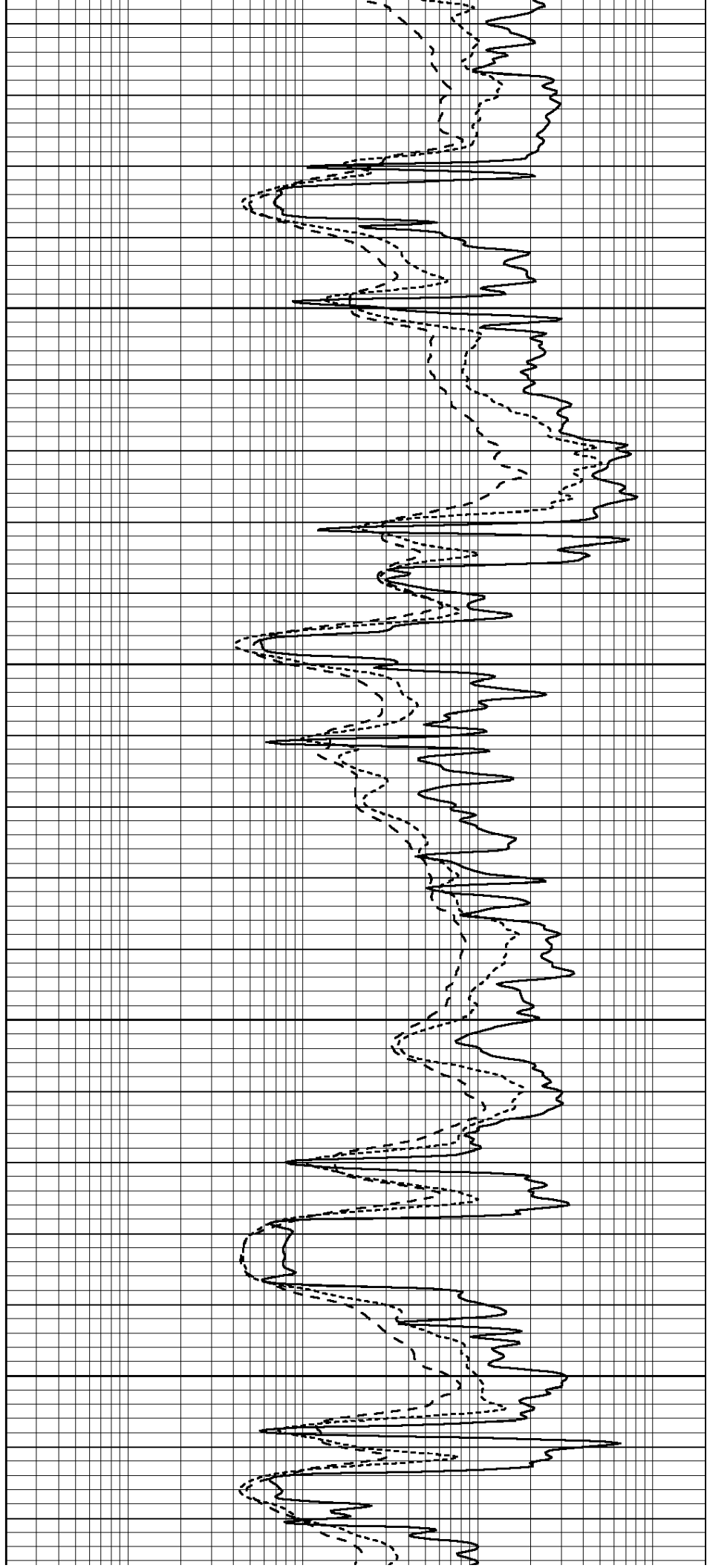


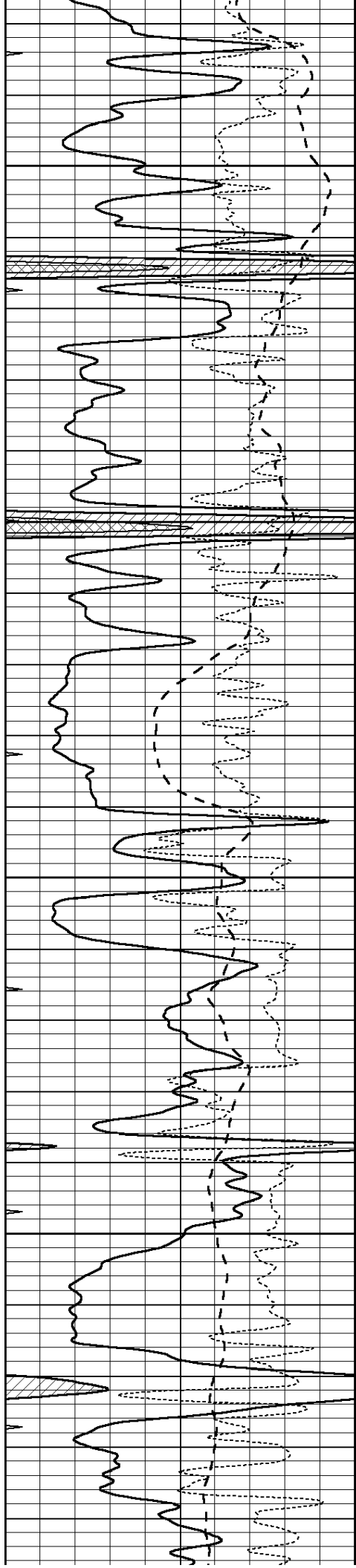
3850

3900

3950

4000



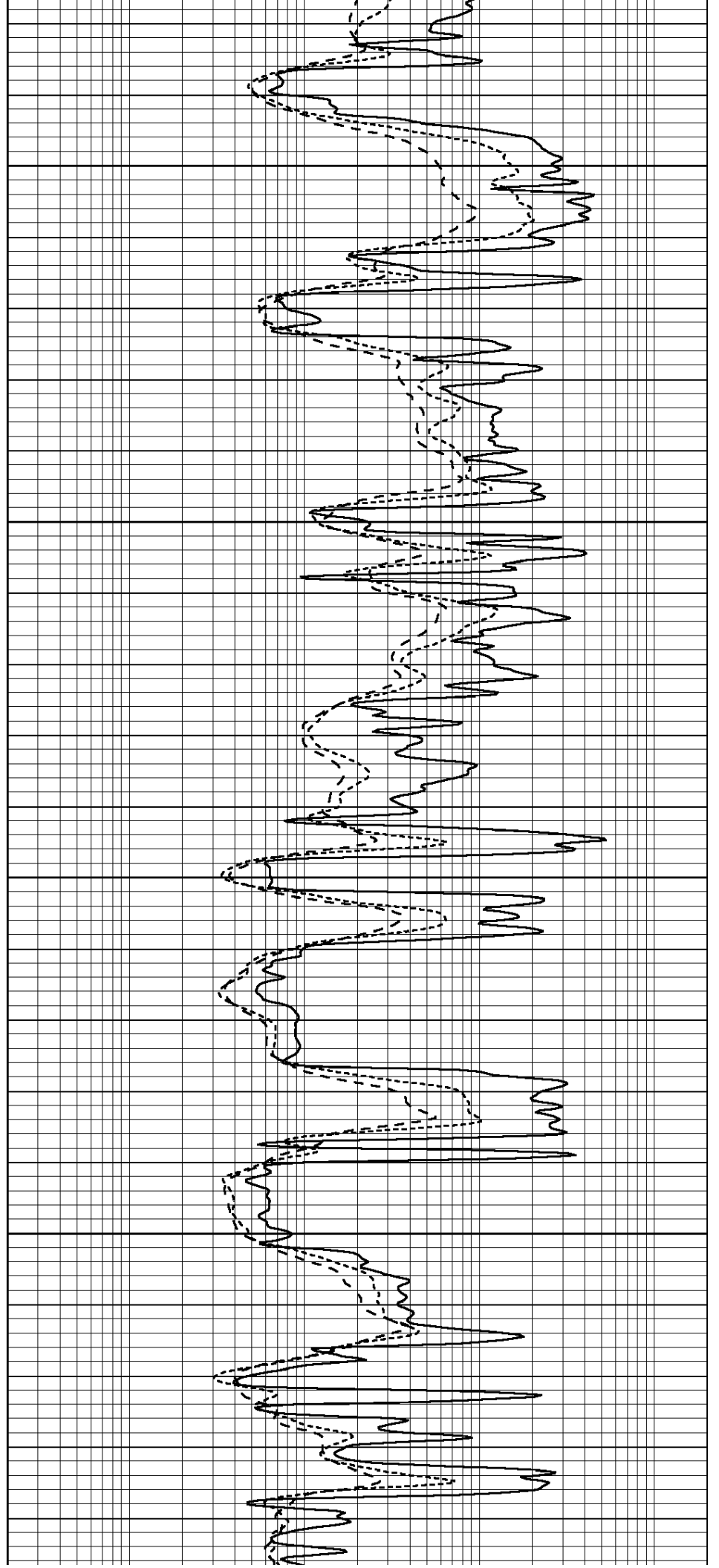


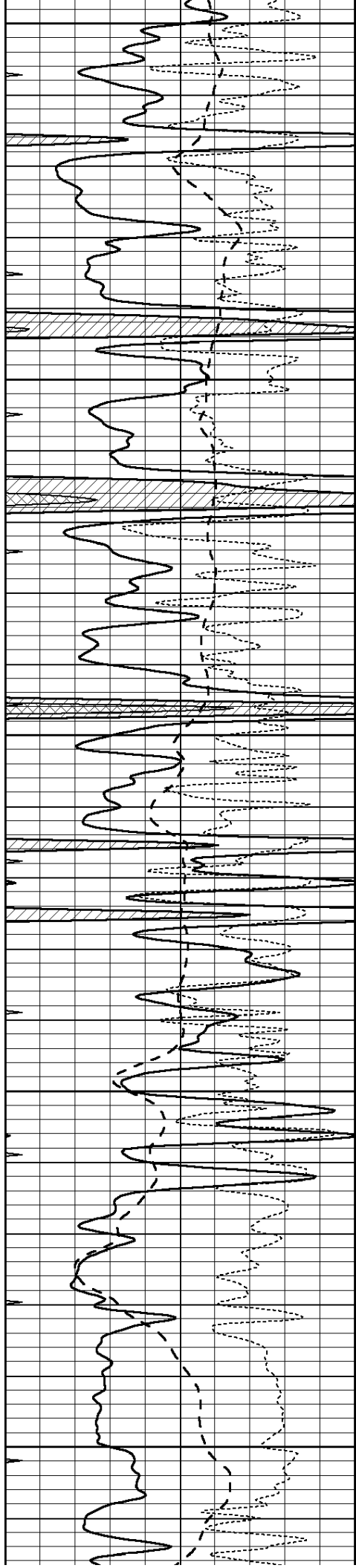
4050

4100

4150

4200





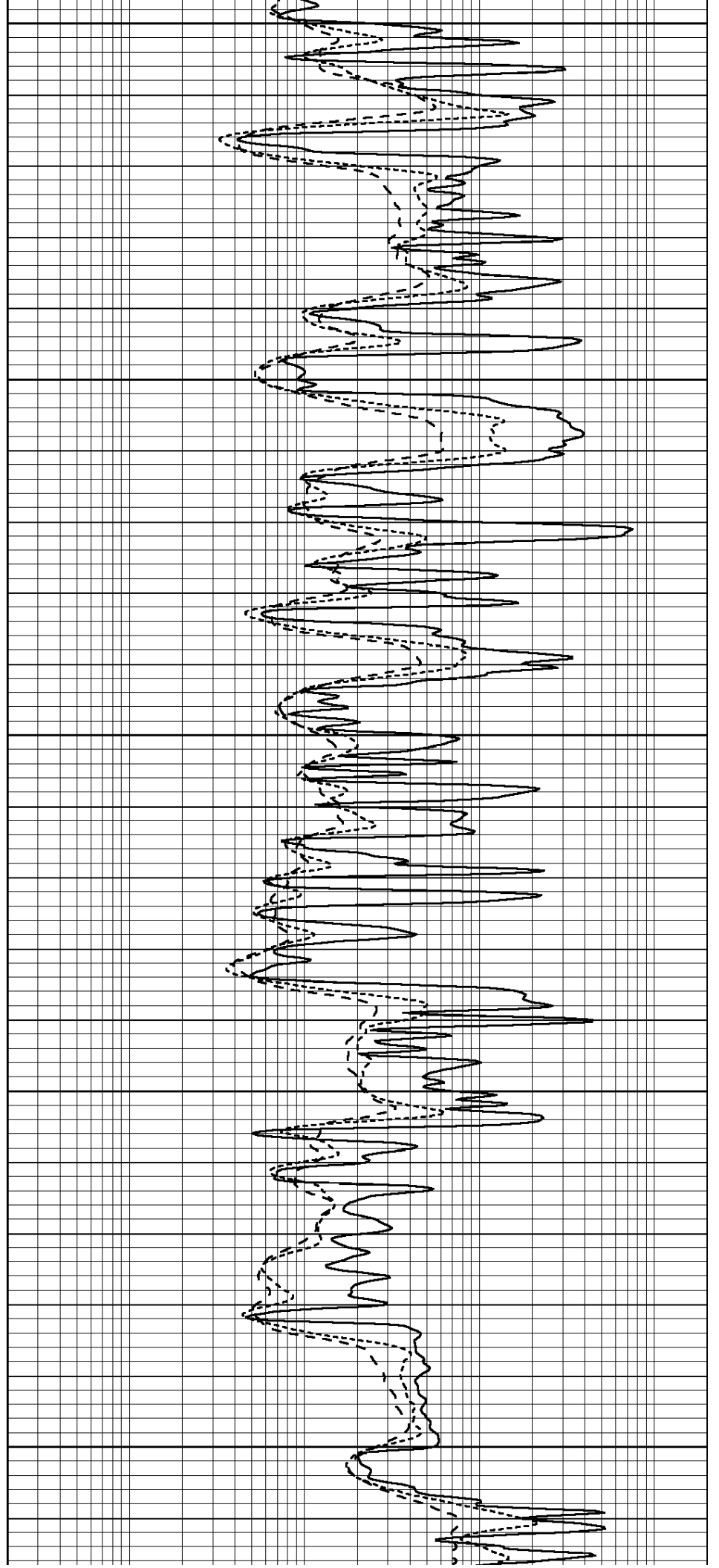
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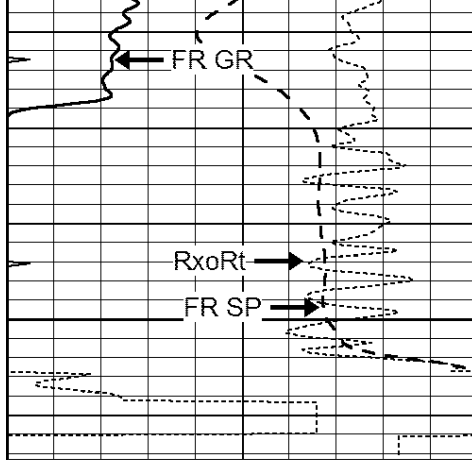
4300

4350

4400

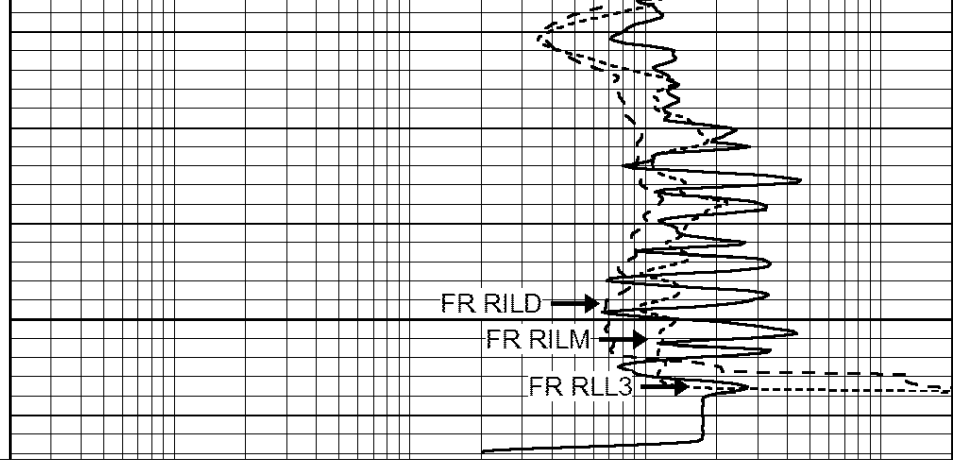
4450





4500  
LTD 4509

|      |                  |     |
|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 20  |



|     |                          |      |
|-----|--------------------------|------|
| 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |
| 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |



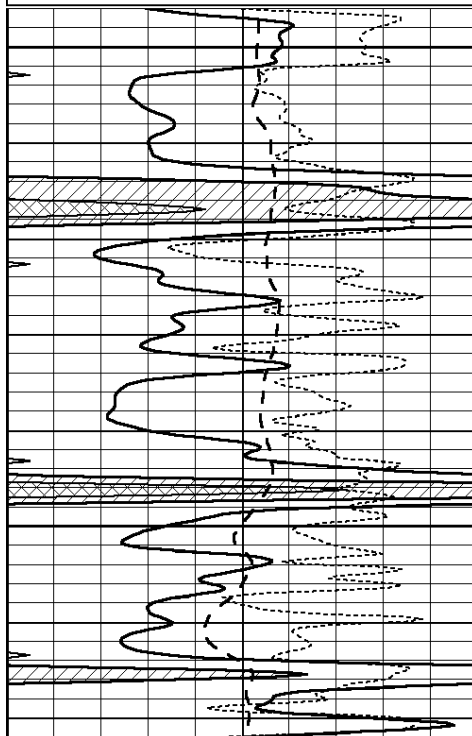
**Casedhole  
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# REPEAT SECTION

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 Dataset Pathname: pass2.1  
 Presentation Format: \_dil  
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 Charted by: Depth in Feet scaled 1:240

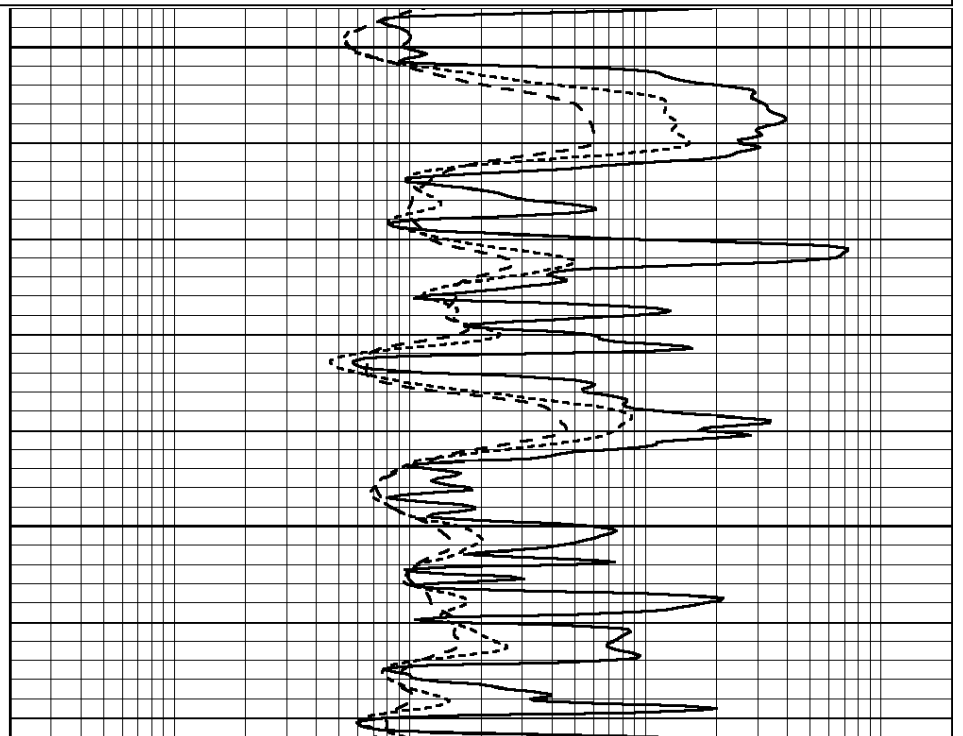
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|------|------------------|-----|
| 0    | GAMMA RAY (GAPI) | 150 |
| -100 | SP (mV)          | 100 |
| -250 | Rxo/Rt           | 50  |
| 0    | MINMK            | 20  |

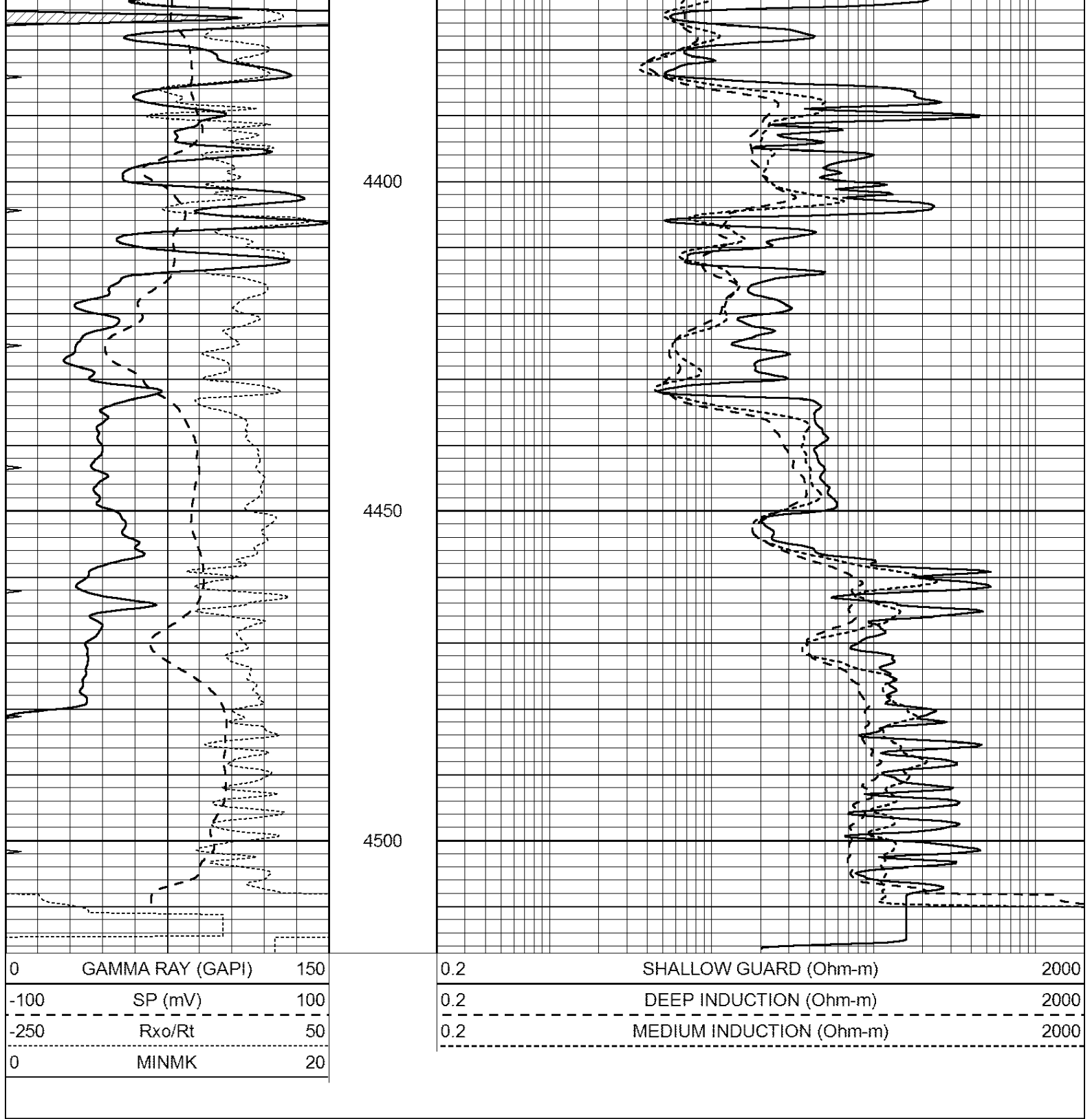
|     |                          |      |
|-----|--------------------------|------|
| 0.2 | SHALLOW GUARD (Ohm-m)    | 2000 |
| 0.2 | DEEP INDUCTION (Ohm-m)   | 2000 |
| 0.2 | MEDIUM INDUCTION (Ohm-m) | 2000 |



4300

4350





Calibration Report

Database File: 30891ddn.db  
 Dataset Pathname: pass2.1  
 Dataset Creation: Sun Jan 17 18:31:26 2016 by Calc Open-Cased 090629

Dual Induction Calibration Report

Serial-Model: PROBE8-DILG  
 Surface Cal Performed: Sun May 10 19:54:09 2015  
 Downhole Cal Performed: Mon Jul 28 11:08:27 2008  
 After Survey Verification Performed: Mon Jul 28 11:08:27 2008

Surface Calibration

Readings

References

Results

| Loop:     | Air   | Loop  |   | Air   | Loop    |        | m       | b       |
|-----------|-------|-------|---|-------|---------|--------|---------|---------|
| Deep      | 0.015 | 0.648 | V | 0.000 | 400.000 | mmho/m | 620.000 | 0.000   |
| Medium    | 0.029 | 0.796 | V | 0.000 | 464.000 | mmho/m | 590.000 | -12.000 |
| Internal: | Zero  | Cal   |   | Zero  | Cal     |        | m       | b       |
| Deep      | 0.017 | 0.657 | V | 0.000 | 400.000 | mmho/m | 625.153 | -10.619 |
| Medium    | 0.016 | 0.757 | V | 0.000 | 464.000 | mmho/m | 625.992 | -9.739  |

| Downhole Calibration |          |        |        |            |          |        |         |       |
|----------------------|----------|--------|--------|------------|----------|--------|---------|-------|
|                      | Readings |        |        | References |          |        | Results |       |
|                      | Zero     | Cal    |        | Zero       | Cal      |        | m'      | b'    |
| Deep                 | 0.000    | 0.000  | mmho/m | 2.011      | 405.777  | mmho/m | 1.000   | 0.000 |
| Medium               | 0.000    | 0.000  | mmho/m | 7.590      | 503.393  | mmho/m | 1.000   | 0.000 |
| LL3                  |          | 7.500  | V      |            | 1500.000 | Ohm-m  |         |       |
|                      |          | 0.000  | V      |            | 20.000   | Ohm-m  |         |       |
|                      |          | -7.200 | V      |            | 3800.000 | mmho-m |         |       |

| After Survey Verification |          |       |        |         |       |        |         |       |
|---------------------------|----------|-------|--------|---------|-------|--------|---------|-------|
|                           | Readings |       |        | Targets |       |        | Results |       |
|                           | Zero     | Cal   |        | Zero    | Cal   |        | m'      | b'    |
| Deep                      | 0.000    | 0.000 | mmho/m | 0.000   | 0.000 | mmho/m | 0.000   | 0.000 |
| Medium                    | 0.000    | 0.000 | mmho/m | 0.000   | 0.000 | mmho/m | 0.000   | 0.000 |
| LL3                       |          | 1.000 | Ohm-m  |         | 1.000 | Ohm-m  |         |       |
|                           |          | 0.000 | Ohm-m  |         | 0.000 | Ohm-m  |         |       |
|                           |          | 1.000 | mmho-m |         | 1.000 | mmho-m |         |       |

**Compensated Density Calibration Report**

|                                       |                          |
|---------------------------------------|--------------------------|
| Serial-Model:                         | GEAR5-GEARHART           |
| Source / Verifier:                    | /                        |
| Master Calibration Performed:         | Sun Dec 06 13:45:22 2015 |
| Before Survey Verification Performed: |                          |
| After Survey Verification Performed:  |                          |

| Master Calibration |                     |      |                             |               |     |  |
|--------------------|---------------------|------|-----------------------------|---------------|-----|--|
|                    | Density             |      | Far Detector                | Near Detector |     |  |
| Magnesium          | 1.710               | g/cc | 798.83                      | 465.02        | cps |  |
| Aluminum           | 2.570               | g/cc | 178.16                      | 323.19        | cps |  |
|                    | Spine Angle = 76.37 |      | Density/Spine Ratio = 0.557 |               |     |  |
|                    | Size                |      | Reading                     |               |     |  |
| Small Ring         | 7.00                | in   | 1.47                        | V             |     |  |
| Large Ring         | 14.00               | in   | 3.01                        | V             |     |  |

| Before Survey Verification |        |      |          |  |      |  |
|----------------------------|--------|------|----------|--|------|--|
|                            | Target |      | Measured |  |      |  |
|                            |        | g/cc |          |  | g/cc |  |
|                            |        | g/cc |          |  | g/cc |  |
|                            |        | g/cc |          |  | g/cc |  |

| After Survey Verification |        |      |          |  |      |  |
|---------------------------|--------|------|----------|--|------|--|
|                           | Target |      | Measured |  |      |  |
|                           |        | g/cc |          |  | g/cc |  |
|                           |        | g/cc |          |  | g/cc |  |

## Compensated Neutron Calibration Report

Serial Number: 6I  
Tool Model: G

## CALIBRATION

| Detector    | Readings | Target   | Normalization |
|-------------|----------|----------|---------------|
| Short Space | 1.00 cps | 1.00 cps | 1.0000        |
| Long Space  | 1.00 cps | 1.00 cps | 1.0000        |

## PRE-SURVEY VERIFICATION

|    | Detector    | Readings | Measured | Target |
|----|-------------|----------|----------|--------|
| 1) | Short Space | cps      |          |        |
|    | Long Space  | cps      | pu       | pu     |
| 2) | Short Space | cps      |          |        |
|    | Long Space  | cps      | pu       |        |
| 3) | Short Space | cps      |          |        |
|    | Long Space  | cps      | pu       |        |

## POST-SURVEY VERIFICATION

|    | Detector    | Readings | Measured | Target |
|----|-------------|----------|----------|--------|
| 1) | Short Space | cps      |          |        |
|    | Long Space  | cps      | pu       | pu     |
| 2) | Short Space | cps      |          |        |
|    | Long Space  | cps      | pu       | pu     |
| 3) | Short Space | cps      |          |        |
|    | Long Space  | cps      | pu       | pu     |

## Gamma Ray Calibration Report

Serial Number: GR6  
Tool Model: OPEN  
Performed: Thu Nov 12 05:47:01 2015

Calibrator Value: 150.0 GAPI

Background Reading: 0.0 cps  
Calibrator Reading: 276.0 cps

Sensitivity: 0.4500 GAPI/cps